

DAVID HOPE PRINCE

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EDUCATION

Airforce Institute of Technology (AFIT)

Kaduna, Nigeria

- Programme: B.Eng. Mechatronics
- Grade: First class Honours; CGPA: 4.71 / 5.00 (Ranked **Top 3** in graduating class)
- Thesis: Development of an autonomous IED detection robot using rocker-bogie mechanism and computer vision. [\[LINK\]](#)

Supervisor: Dr. Yekini Bello

Apr 2021 - Jul 2025

RESEARCH INTERESTS

Computer Vision for Robotics; Embodied AI; Scene Understanding and Intelligent Navigation; Intelligent Embedded Systems for Perception and Automation

RESEARCH & TEACHING EXPERIENCE

Antzhub (Techspace Innovators)

Abuja , Nigeria

Robotics Instructor [\[LINK\]](#)

Oct 2025- Present

- Spearheaded technical training and curriculum development in robotics and embedded systems for 50+ middle and high school students, fostering hands-on STEM skills
- Authored comprehensive instructional materials, including outlines, continuum documents, and PowerPoint slides, to standardize technical instruction across programs.
- Facilitated student learning through personalized guidance in hardware prototyping. [\[LINK\]](#)

Airforce Institute of Technology

Kaduna, Nigeria

Final Year Research Project

Jan 2025 – July 2025

- Designed and developed a mobile robot featuring NASA-inspired rocker-bogie suspension for enhanced stability on rugged terrains.
- Collected and annotated over 1,000 images of IEDs and components to create a custom dataset for training an object detection model.
- Integrated YOLOv11 with ESP32-CAM for real-time IED detection, achieving a mean Average Precision (mAP@50-95) of 0.963, 98% precision, and 30 FPS processing speed.
- Implemented PID-controlled navigation algorithms for precise heading correction and effective obstacle avoidance, advancing autonomous robotic capabilities in security applications [\[LINK\]](#)

Airforce Institute of Technology

Kaduna, Nigeria

Student Tutor

Jan 2021 – July 2025

- Taught course mates in Virtual Labs, Computer Aided Design (AutoCAD/SolidWorks), and Engineering Mathematics, providing personalized guidance and interactive problem-solving sessions.
- Developed custom notes and case studies to clarify complex concepts, resulting in enhanced comprehension and positive feedback from over 30 peers, boosting their confidence in Virtual Labs, CAD tools, and Engineering Mathematics.

PROFESSIONAL EXPERIENCE

Antzhub (Techspace Innovators)

Abuja , Nigeria

Robotics & Embedded System Engineer [\[LINK\]](#)

Oct 2025- Present

- Conducted hardware prototyping for robotics and embedded systems, designing and assembling electronic components to meet project specifications.
- Performed rigorous testing of electronic hardware and robotics kits, identifying and resolving issues to ensure optimal performance.

National Centre for Artificial Intelligence and Robotics (NCAIR)

Abuja , Nigeria

Intern [\[LINK\]](#)

Jun 2024- Oct 2024

- Replicated state-of-the-art computer vision architectures, including LeNet, AlexNet, and MobileNet, on open-source datasets using Pytorch and Tensorflow to benchmark performance in image classification tasks.

- Developed a heart rate monitoring system to detect key ECG features (P, Q, R, S, T waves) and simulate blood pressure (diastolic/systolic) values from electrocardiogram readings, integrated with IoT for real-time vital signal visualization on mobile and desktop devices.
- Applied ensemble learning via gradient boosting to predict house prices using the Ames Housing dataset, achieving an RMSE of 0.1155.

Industrial Training Fund (Mechatronics Department)

Abuja , Nigeria

Intern [\[LINK\]](#)

Dec 2023- Jan 2024

- Automated an industrial process using Programmable Logic Controllers (PLCs) and ladder logic integrated with proximity sensors, enhancing operational efficiency and precision in automated systems.
- Participated in hands-on training on hydraulic and pneumatic actuators, directional control valves, and valve control systems for industrial automation.
- Gained practical experience in electrical power systems, including induction motors and 3-phase motor configurations, through interactive sessions and applications.

LEADERSHIP EXPERIENCE

Airforce Institute of Technology (AFIT)

Kaduna, Nigeria

Project Lead (Final Year Project)

Jan 2025 –Jul 2025

- Led a team of 3 final-year students through the complete design, development, prototyping, and presentation of an autonomous IED-detection robot using rocker-bogie suspension and computer vision.
- Supervised the compilation and annotation of over 1,000 IED and component images (sourced from physical replicas and web scraping), ensuring dataset quality and project milestones were met on schedule.
- Led project planning and execution, task coordination, technical review writing, and final defense preparation, resulting in a direct CGPA average increase of 0.105 point on the 5.0 grading scale.

Faith Academy Day Secondary School

Abuja , Nigeria

Library Prefect [\[LINK\]](#)

Sept 2018 – Sept 2020

- Supervised library sessions for over 1,000 secondary school students from JSS1 to SS3 classes, ensuring orderly access to resources and promoting a conducive learning environment.
- Managed daily operations, including book organization and student assistance with the school Librarian.

VOLUNTEERING & COMMUNITY SERVICE

Capital Science Academy

Abuja, Nigeria

STEM Robotics Club Tutor

October – Present

- Taught weekly 4-hour robotics and electronics sessions to 50+ middle and high school students, delivering hands-on Arduino-based projects from basic circuits to fully functional robots. [\[LINK\]](#)

Airforce Institute of Technology

Kaduna, Nigeria

Final Year Project Support

Jan – Jul

- Provided specialized technical assistance to course mates for their final year projects, focusing on implementation and hardware optimization
- Key contributions included PID controller tuning and circuit soldering for a Quadcopter project, and assisting with code logic implementation, 3D printing, and soldering for a Solar Astronomical Tracker.

Smart Irrigation System Student Project

STEM Instructor Lead

- Led and mentored a team of secondary school students to design, build, and demonstrate a smart irrigation system using soil moisture sensors, relays, and pump control for the 2025 STEAM Competition. [\[LINK\]](#)

SKILLS

Programming Languages: Python, C++; **Computer Vision & Deep Learning:** YOLO (v8, v11), CNN, SSD, Image Processing, Data Annotation; **Machine Learning Frameworks:** PyTorch, TensorFlow, Keras, scikit-learn, XGBoost; **Embedded Systems & IoT:** ESP32, ESP8266, Arduino, Hardware Prototyping, Firebase; **Robotics & Simulation:** Webots, ROS2; **Design & Modeling:** AutoCAD, SolidWorks; **Development Tools:** VS Code, Jupyter Notebook, Arduino

IDE; **Version Control:** Git, GitHub; **Soft Skills - Project Management, Team Collaboration;** **Soft Skills:** Teaching, Critical Thinking, Technical Writing, Mentorship.

RELATED PROJECTS

Vision-Based Traffic Signal Control for Emergency Response Optimization

Jun 2025 – Jul 2025

- Built a prototype for a Vision based Traffic Light Signal Control in smart cities prioritizing emergency vehicles (ambulance, police, fire Trucks) when present and the busiest lane in situations where emergency vehicles are not present
- Trained a custom computer vision model to detect and classify scaled model vehicles in real time [\[LINK\]](#)

Face Tracking Turret with Proportional Integral Derivative Control

Mar 2025 – Jun 2025

- Designed and built an autonomous pan-tilt turret that detects human faces and dual-axis PID control to track them in real time.
- Implemented and tuned a Proportional Integral Derivative Controller (PID) for jitter free motion. [\[LINK\]](#)

Solar Tracking system

Jan 2025

- Designed and built an automated single-axis solar tracker using dual LDR sensors in differential configuration and an SG90 servo to continuously align the solar panel with the sun for improved power generation.
- Implemented and tuned a PID controller and integrated real-time panel voltage monitoring via voltage divider on an LCD display [\[LINK\]](#)

PUBLICATIONS

Hope Prince David, Yekini Bello, Kafayat, Oluwatoyin Shobowale, Oladepo Teslim, Aroge Damilare Daniel. *Development of an Autonomous IED Detection Rover Using Computer Vision and Rocker-Bogie Mechanism*. Journal of Mechatronics and Intelligent Manufacturing. (Under Review), 2025.

RELATED ARTICLES

Artificial Intelligence in Solving Africa's Healthcare Challenges

November 2025

Practical AI applications to improve diagnostics, access, and operational efficiency across African healthcare systems.

[\[LINK\]](#)

CERTIFICATIONS

- Machine Learning Specialization – [DeepLearning.AI & Stanford University](#) (Aug 2024)
- Unsupervised Learning, Recommenders, and Reinforcement Learning – [DeepLearning.AI & Stanford University](#) (Aug 2024)
- Advanced Learning Algorithms – [DeepLearning.AI & Stanford University](#) (Jul 2024)
- Supervised Machine Learning: Regression and Classification – [DeepLearning.AI & Stanford University](#) (Jun 2024)
- Embedded Systems Cohort – National Centre for Artificial Intelligence and Robotics (2024)
- Python Beginners Cohort – National Centre for Artificial Intelligence and Robotics (2023)
- Python Intermediate Cohort – National Centre for Artificial Intelligence and Robotics (2024)

HONORS & AWARDS

- **First Class Honors**, B.Eng. Mechatronics — Air Force Institute of Technology (AFIT).
- **Top Project Award** at the AFIT Mechatronics Exhibition, leading to selection as **one of 4 Nigerian Student** Representatives invited to attend and exhibit at the maiden African Chiefs of Defense Staff Summit.
- **Valedictorian** (Best Graduating Student) of the Technical Class, Faith Academy School.
- **Best Student** in Mathematics, Further Mathematics, and Geography (Faith Academy School).
- **First Runner Up** in the JAMB Examination (Faith Academy School).
- **Mathematics Genius** Award (Faith Academy School).