

# Hameed Ijadunola

ijadunolahameed@gmail.com | 865-406-6603 | github.com/hameed-ijadunola

## PROFILE

---

Ph.D. candidate in Computer Engineering specializing in computer vision, deep learning, and multimodal AI. Experience spans tiny object detection, hyperspectral imaging, and vision-language models, with 4+ years of software engineering in scalable mobile and web systems. Focused on developing efficient, high-performance AI systems for real-world applications.

## EDUCATION

---

### University of Tennessee, Knoxville

*Pursuing Ph.D. in Computer Engineering*

Knoxville, TN, USA

*Aug 2024 – Present*

- **Research Specialization:** Computer Vision, Machine Learning, and Artificial Intelligence
- **Relevant Coursework:** Computer Vision, Computer Systems & Organization, Deep Learning, Machine Learning, Robot Learning, Human-Computer Interaction

### Federal University of Technology Akure

*B.Eng. in Computer Engineering, First Class Honors*

Akure, Nigeria

*Graduated 2021*

- Senior Project: Smart Metering Circuit and Communication Optimization

## TECHNICAL SKILLS

---

**Programming Languages:** Python, JavaScript/TypeScript, Java, C++, SQL, Bash

**Machine Learning:** PyTorch, PyTorch Lightning, TensorFlow, Scikit-learn, Hugging Face

**Computer Vision:** Object Detection (YOLO, FCOS, RetinaNet, SSD), Image Segmentation, Multimodal Models (CLIP, LLaVA)

**Data Science:** Pandas, NumPy, Matplotlib, OpenCV

**Software Development:** React Native, React.js, Next.js, Node.js, FastAPI, REST APIs

**Cloud & DevOps:** AWS, GCP, Docker, CI/CD, Linux

**Databases:** PostgreSQL, MySQL, MongoDB, Firebase

**Embedded Systems:** ARM, AVR, PCB Design, Wireless (Wi-Fi, Bluetooth, Zigbee, LoRa)

## RESEARCH EXPERIENCE

---

### Graduate Research Assistant – AICIP Group

*University of Tennessee, Knoxville*

Knoxville, TN, USA

*Aug 2024 – Present*

- Co-lead research on tiny object detection for tire defect analysis using FCOS, RetinaNet, and SSD, incorporating anchor design, FPN ablations, and patch-based training strategies, improving detection performance on extremely small objects by 10-15%.
- Develop and evaluate multimodal vision-language models (e.g., CLIP-based, LLaVA-based models) to enhance representation learning and improve downstream image understanding performance.
- Built temporal machine learning models (LSTM, and Transformer models) for mastitis detection in cattle using longitudinal data, achieving 91% accuracy through feature engineering and supervised learning methods.
- Design and implement deep learning pipelines for large-scale image and multimodal datasets using PyTorch, enabling efficient training and evaluation across vision tasks.
- Collaborate on research targeting top-tier venues (e.g., ECCV, CVPR, ICML), contributing to model design, experimentation, and empirical evaluation.

### Graduate Teaching Assistant – EECS Department

*University of Tennessee, Knoxville*

Knoxville, TN, USA

*Aug 2025 – Present*

- Instruct students on PyTorch, data preprocessing, multilayer perceptrons, convolutional neural networks, and model evaluation techniques for COSC-525 (Deep Learning).
- Guide lab sessions for ECE-201 (Circuits II), covering Ohm's Law, Kirchhoff's Laws, Thevenin and Norton equivalents, RLC circuits, and operational amplifiers.
- Lead tutorials, troubleshoot assignments, and support students across both courses through office hours and lab instruction.

### Research Assistant

*Federal University of Technology Akure*

Akure, Nigeria

*Aug 2020 – Oct 2021*

- Conducted research on energy-efficient smart metering circuits to optimize power consumption and improve communication efficiency.

- Developed software tools to monitor and analyze performance metrics in smart metering systems.

### **IoT Research Intern**

*MIU Research*

Lagos, Nigeria

*Jun 2019 – Dec 2019*

- Researched methods to improve the energy efficiency of integrated circuits and microcontrollers for IoT systems.

## **PROFESSIONAL EXPERIENCE**

---

### **Hyperspectral Image Analyst Intern**

*EnSenSys*

Alamo, TN, USA

*Jun 2025 – Aug 2025*

- Processed and analyzed high-dimensional hyperspectral imagery (100+ spectral bands) using spectral unmixing (MVC-NMF) and dimensionality reduction (PCA, autoencoders).
- Developed pixel-wise classification models, improving accuracy by 8 percentage points over PCA-based baselines and enhancing class separability.
- Optimized hyperspectral feature extraction pipelines, reducing processing time by 25% and enabling faster downstream disease prediction.

### **Software Engineer**

*Spinel Consulting*

Remote

*Mar 2023 – Aug 2024*

- Designed and deployed scalable cross-platform mobile applications for iOS and Android using React Native, supporting an active user base of 10k–30k users.
- Improved mobile application responsiveness and reduced load times by 20% through deferred component loading, memoization, reduced network requests, and optimized state management.
- Engineered CI/CD pipelines, automated testing, and deployment workflows, reducing release time by 75% and minimizing post-release defects.

### **Software Engineer**

*Softwater Solutions*

Remote

*Apr 2022 – Mar 2023*

- Accelerated cross-platform mobile development cycles by 50% through React Native frameworks, reusable component libraries, and shared UI architecture.
- Designed reusable React Native components with accessibility support, improving screen-reader compatibility and reducing duplicate frontend code.
- Reduced application load times by 50% by identifying frontend and backend bottlenecks and applying targeted performance optimizations.

### **Software Engineer**

*Sabi*

Lagos, Nigeria

*Nov 2021 – Apr 2022*

- Engineered responsive web interfaces using HTML5, CSS3, React.js, Next.js, improving rendering performance and usability.
- Implemented a mobile-first frontend strategy that improved small-screen performance and increased mobile user retention by 20%.
- Integrated JavaScript-driven interactions and optimized rendering paths to improve user engagement and average session duration.

## **SELECTED PROJECTS**

---

### **Tiny Object Detection for Tire Defects**

*PyTorch, FCOS, RetinaNet, SSD*

Research Project

*2024 – Present*

- Developed deep learning pipelines for tire defect detection on X-ray imagery, targeting extremely small objects with challenging spatial characteristics.
- Implemented patch-based training, anchor optimization, and FPN connectivity experiments, improving small-object mAP COCO by 5%.

### **Hyperspectral Disease Detection**

*PyTorch, PCA, Autoencoders, MVC-NMF*

Research Project

*2025*

- Designed hyperspectral classification pipelines using PCA, autoencoders, and MVC-NMF for dimensionality reduction and feature extraction.
- Compared classical and deep learning methods for spectral representation learning, improving classification robustness across high-dimensional inputs.

## PUBLICATIONS

---

- A. Cozma, **H. A. Ijadunola**, J. Dosch, C. Murphy, and H. Qi. “Architecture Follows Data: CNN Backbone Design for Tiny Object Detection.” Under review at *European Conference on Computer Vision (ECCV)*, 2026.
- F. M. Dahunsi, **H. Ijadunola**, A. O. Melodi, and A. A. Ponnle. “Analysis of GSM, Wi-Fi and LPWAN Communication Technologies for Smart Energy Metering Circuits.” In *2022 IEEE Nigeria 4th International Conference on Disruptive Technologies for Sustainable Development (NIGERCON)*, Lagos, Nigeria, 2022, pp. 1–5. DOI: 10.1109/NIGERCON54645.2022.9803085.