

# BRANDONE FONYA

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## Summary

I am a graduate research assistant and a final-year Master's student in Engineering Artificial Intelligence at Carnegie Mellon University, focusing on machine learning and computer vision. My research interests include deep learning for computer vision and its applications in medical imaging, healthcare, and autonomous systems.

## Education

### Carnegie Mellon University

Aug 2024 – Present

*M.Sc. in Engineering Artificial Intelligence (Specialization: Machine Learning)*

CGPA: 3.7/4

### ICT University

Oct 2022 – May 2024

*B.Sc. in Software Engineering (Honors)*

CGPA: 3.65/4, Ranked 1st out of 70 students in the Computer Engineering Department.

### Siantou University Institute

Sep 2020 – Jul 2022

*Higher National Diploma in Software Engineering*

Grade: Distinction, Ranked 3rd out of 536 students in Cameroon for Software Engineering 2022 national exams

## Professional Experience

### Research Assistant

Sep 2025 – Present

*The Upanzi Network, Digital Public Infrastructure Research Lab*

*Kigali, Rwanda*

Working on a generative precision oncology pipeline for Africa, integrating multi-omics, clinical, and environmental data to generate synthetic datasets using VAEs, Bayesian networks, and diffusion models.

### Graduate Teaching Assistant (18-751 Applied Stochastic Processes)

Aug 2025 – Present

*Carnegie Mellon University, Kigali, Rwanda*

Grading exams and assignments, hosting weekly office hours, leading recitations, and assisting students with core stochastic processes concepts.

### Research Intern

Jul 2025 – Sep 2025

*Autonomous Intelligence Lab, Westlake University, Hangzhou, China*

Developed MedBLIPNet3D, a text-prompted 3D prostate MRI segmentation framework using MedicalNet ResNet-18, PubMedBERT, cross-attention fusion (MedQFormer), and a prompt-conditioned segmentation head.

### Graduate Research Assistant

Jun 2025 – Sep 2025

*Carnegie Mellon University – Makerere University CHS (Joint Research)*

Conducted research on low-cost tuberculosis screening using deep learning on solicited cough sounds for early TB detection in low-resource settings.

#### **Graduate IT Associate – Full Stack Developer**

Aug 2024 – May 2025

*Carnegie Mellon University Africa*

Developed and scaled CMU-Africa's job board using the MERN stack, migrating legacy Java backend systems to Node/Express.js and integrating actionable data visualizations.

#### **Founder, ESchools LMS**

Dec 2022 – Jun 2024

*Yaoundé, Cameroon*

Built an AI-powered learning management system integrating chatbots and automation to support virtual education for students, teachers, and administrators across Cameroon.

## **Publications**

**Fonya, B.**, Tagha, N., Rugumbira, M., Busah, I., Aiken, E. *Optimizing healthcare facility distribution in Rwanda: a data-driven approach (conference proceeding)*. *European Journal of Public Health* 35, 4 (2025). <https://doi.org/10.1093/eurpub/ckaf161.1554>

## **Research & Projects**

#### **CAM-FD: Improving Adversarial Robustness in Medical Imaging**

*CMU, MSc Research*

*Capstone*

Supervisor: Prof. Prasenjit Mitra

CAM-FD is a Curriculum Adversarial Mixup with Feature Denoising framework integrating cross-entropy mixup, TRADES KL divergence, feature denoising, and adversarial weight perturbation to jointly improve robustness, accuracy, and domain generalization.

#### **Optimizing healthcare facility distribution in Rwanda: a data-driven approach**

*CMU, Spring 2025*

Supervisor: Prof. Emily Aiken

Accepted for poster presentation at the European Public Health Conference (EPH) 2025. Conducted geospatial and ML-based analysis to optimize healthcare resource allocation and address disparities in malaria, TB, and HIV care across sub-Saharan Africa.

#### **Real-Time Sign Language Recognition and Speech Transcription**

*CMU, Spring 2025*

Supervisor: Prof. Clarence Worrell

Built a CNN-based ASL recognition system integrated with Mediapipe for live video input and text-to-speech for real-time audio feedback.

#### **Brain Tumor Screening**

*ICT University, Spring 2024*

Supervisor: Prof. Luc Ngend Estein

Developed a TensorFlow CNN system achieving 99.0% accuracy on MRI tumor detection, deployed as a Flask based web application for clinical use.

## **Skills & Certifications**

**Skills:** Problem solving, collaboration, communication, software engineering, machine learning, deep learning

**Technologies:** Python, C/C++, JavaScript, Java, Git, Jupyter, MATLAB, LaTeX, Wandb

**Libraries/Frameworks:** PyTorch, TensorFlow, NumPy, Pandas, OpenCV, CMake, Flask, Scikit-learn, GeoPandas, Node.js, Express.js, React, React Native, Angular

**Languages:** English (Native), French (Advanced)

**Certifications:** AWS Cloud Foundations, Secure Full Stack MEAN Developer (EC-Council), Google Project Management

## Interests & Achievements

**Interests:** Deep Learning, Computer Vision, Medical Imaging, Generative AI

**Achievements:** AMLD Africa 2026 Reviewer, B.Sc. Department Valedictorian, Cameroon PremierDev Tech Award Winner (2023), ICT University Fellowship of Excellence.