

# GANONTHA PAYANG BRUNO

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## SUMMARY

AI & Machine learning Engineer with a strong background in software engineering. My career focus is in AI research, leveraging the AI capabilities to make significant good impacts on lives of millions. My focus is AI Safety and alignment, more especially Mechanical Interpretability. I reverse engineer neural networks to understand thoughts process and therefore enforce safety barrier

## EDUCATION

### Masters of Science in Information Technology

August 2025 - May 2027

Carnegie Mellon University, Kigali, Rwanda

Artificial Intelligence, Machine Learning, Data Analytics, Software Development, Computer Networking, Research

### Bachelor in Management of Information Systems

October 2019 - August 2022

African Development University, Niamey, Niger

Information technology, Data Analytics software development, Entrepreneurship and Leadership

## PROFESSIONAL EXPERIENCE

### Graduate Teaching Assistant

January 2026 - May 2026

Carnegie Mellon University, Kigali, Rwanda

- Assisted professor with teaching
- Helped students understand course concepts and respond to inquiries via daily Office Hours
- Responsible of grading homework

### Software Developer

May 2025 - August 2025

PayiSkoul, Abidjan, Cote d'Ivoire, Abidjan

- Developed a mobile application with Flutter, integrated REST API and web Socket for instant messaging
- Integrated KYC system from external provider for instant identity verification ensuring 100% identity.

### Software Developer

March 2024 - August 2024

ONG APIS, Niamey, Niger

- Created a full stack web application and enhanced external and internal communications using mailing system
- Increased visibility of the NGO from 10 to 100+ volunteers per month.

## PROJECTS

### Cross-Robustness Analysis of Lightweight Object Detection

October 2025 - December 2025

- Evaluated YOLOv11 models against natural degradations (fog, blur) and digital adversarial attacks (PGD) to identify safety gaps.
- Curated the "Kigali Motorcycle Dataset" and applied heavy natural augmentation to improve environmental resilience in LMIC contexts.

### Predict Global Homicide Trends via Economic Indicators

October 2025 - December 2025

- Processed and cleaned a longitudinal dataset covering 185 countries (2008–2022) to analyze correlation between GDP per capita and intentional homicide rates using Python.
- Developed and evaluated multiple predictive models, including Linear Regression, Ridge Regression, and Random Forest, achieving a best-fit  $R^2$  of 0.51 through 5-fold cross-validation.

### Robustness of RAG Systems on Low Resource Languages

January 2026 - Present

- Investigate robustness of RAG system under noisy documents on low resource languages.
- Construct an abstention mechanism for RAG for African languages.

- Compare safety level against high resource languages.

### **Content Management System web App**

**July 2025 - December 2025**

- Built a CMS to manage invoice, public website, client mobile application for a construction company.
- Built full stack application with Python Django, Flutter and HTML3.
- Deployed application on cloud environment.

### **Lite-LDM - Generating High Quality Compute-Efficient Chest CT**

**February 2026 - Present**

- Lead team effort in brainstorming and conducting ablation studies using denoising diffusion models with lightweight encoders
- Oversee action planning, task distribution and smooth communication with faculty mentor.
- **Project link:** <https://github.com/GanonthaBr/Lite-LDM>

## **SKILLS**

**Computer Programming:** Python, Numpy, PyTorch, Keras

**Technical:** Machine Learning, Deep Learning and Research, LLMs

**Soft:** Leadership, Problem Solving and Marketing

**Language:** French(Native), English (Proficient), Local Arabic(Basic),

## **COMMUNITY INVOLVEMENT**

### **Technical Support**

**October 2023 - July 2025**

*Eglise Evangelique de la Republique du, Niger (EERN)*

- Offered Technical support during church services including Projection, photography and more.

### **Ministry Of Technology, Student Council**

**October 2021 - July 2022**

*African Development University, Niamey, Niger*

- Promoted Technology in student community
- Organized 5+ training workshops on digital literacy