

Felix Hirwa Nshuti

Kigali, Rwanda | fhirwans@andrew.cmu.edu | +250 786 706 507
Links: [linkedin.com/in/fnhirwa](https://www.linkedin.com/in/fnhirwa) | github.com/fnhirwa | <https://fnhirwa.github.io>

Summary

My research interests lie at the intersection of computer architecture, compilers, and machine learning, with a focus on building efficient systems for AI workloads. I explore how compiler optimizations, hardware-aware scheduling, and specialized architectures can accelerate deep learning model training and inference. I am an open-source contributor and maintainer.

Education

Carnegie Mellon University (CMU-Africa)
Master of Science in Electrical and Computer Engineering

Kigali, Rwanda
May 2025 – Present

Pandit Deendayal Energy University
Bachelor of Technology in Computer Engineering

Gujarat, India
October 2021 – May 2025

Projects

TransISA, a lightweight CISC-to-RISC Transpiler
Compiler Design and Architecture Translation

Dec 2024 – May 2025
LLVM, x86, AArch64, C++, IR, CFG

- <https://github.com/fnhirwa/TransISA>
- Designed and implemented a compiler pipeline using the LLVM C++ API to translate x86 assembly to AArch64 assembly via LLVM IR.
- Extracted and analyzed Control Flow Graphs (CFGs) of source programs to support instruction-level translation.

Scaling Deep learning backends with sktime
Machine Learning with time Series

May 2024 – Aug 2024
Python, PyTorch, TensorFlow, Darts, CI/CD

- <https://fnhirwa.github.io/gsoc2024/>
- Added new classification models to sktime using PyTorch (GRU and GRU-FCNN Classifiers).
- Efficiently migrated the classifier models from legacy sktime-dl to sktime main repository.
- Implemented the modular interface of darts regression models in sktime.

Extracting LLVM IR and CFG from C/C++ and Python Programs
Structural Code Representation understanding

October 2024
Programming Languages, LLVM, IR, CFG, AST

- <https://github.com/fnhirwa/struco/>
- Leveraging the powerful LLVM IR managed to extract and analyse the Control Flow Graphs of different code snippets.

Professional Experience

Contributor
Google Summer of Code, sktime

May 2024 – Aug 2024
Remote, Remote

- Scaled Deep Learning backends with sktime, mostly worked with Darts and PyTorch.
- Implemented the modular interface of darts regression models in sktime.
- Presented my project progress at weekly mentorship meetings.
- Facilitated the community development through sprints, discord chats, and weekly community events presentations.

Machine Learning Engineer
Unify

June 2023 – October 2023
London, United Kingdom

- Carried out the maintenance and development of Ivy, a unified Deep Learning framework, enhancing its functionality and performance.
- Established a framework for monitoring adherence to Array API standards, identifying key areas for improvement, and engaging with developers in continuous feedback loops to enhance compliance.
- Teamed up with the community member in the weekly paper reading group.

- Led development and maintenance of the Numpy Frontend of Ivy.
- Empowered community development through discussions, github issues and pull request reviews on open-source projects.

Machine Learning Engineer Intern

September 2022 – June 2023

Unify

London, United Kingdom

- Carried out maintenance and development of Ivy, a unified Deep Learning framework, enhancing its functionality and performance.
- Teamed up with Numpy frontend Team to setup the development pipeline.

Apprentice Software Developer

April 2021 – May 2021

Rohde & Schwarz

Kigali, Rwanda

- Developed Cybersecurity test software by using some automation libraries of Python like Selenium.
- Facilitated team to deliver quality software over time.
- Presented final product to the customer and delivered the product to production.

Volunteering Experience

Community Council Member

Oct 2024 – Aug 2025

Sktime

Remote, Remote

- Facilitating decision making and conflict resolution through mediation on the roadmap planning.
- Assisting contributors to get started with open-source and provide continuous constructive feedback.
- Collaborating with external organizations and looking for funds to drive the open-source ecosystem.
- Engaging with community through discussions, github issues and pull request reviews on open-source projects.

Core Developer

Sep 2024 – Aug 2025

Sktime

Remote, Remote

- Implementing new features to sktime, pytorch-forecasting, and other related projects and continuous maintenance.
- Facilitating team through research and new algorithms implementation.

Volunteering Developer

July 2022 – September 2022

Unify

London, United Kingdom

- Implemented new feature to Ivy (a Unified Deep Learning Library).

Mentor

August 2021 – April 2023

DeepLearning.AI

California, United States

- Mentored Learners taking TensorFlow Developer Professional Certificate on Coursera by providing assistance with issues faced during the course.

Mentor

September 2021 – October 2021

AI Planet

Remote, Remote

- Facilitated learners taking the Data Science Mini Bootcamp Series from AI Planet(formerly DPhi).
- Created learning assignments for the Python course.
- Collaborated with the team to provide constructive feedback to learners.

Co-Mentor

April 2023 – August 2023

Google Summer of code

Remote, Remote

- Volunteered as an assistant mentor for 2023 GSOC contributors working on ivy projects (<https://github.com/ivy-llc/ivy>).

Skills

Programming Languages: Python, C/C++, CUDA, Assembly

Deep Learning Frameworks: PyTorch, Jax, TensorFlow, Paddle

Libraries & Tools: NumPy, Pandas, Scikit-learn, OpenCV, Git/GitHub, Docker

Natural Languages: English (fluent), Kinyarwanda (Proficient)