

Ricky Sambo Macharm - Curriculum Vitae

Personal Information

Date of Birth	27 October, 1974
Nationality	Nigerian
Place of Residence	Germany

Executive Summary

Ricky Sambo Macharm is a Data Scientist and AI/ML professional with a strong engineering foundation, and nearly a decade of experience spanning Data Science, Artificial Intelligence, Data Engineering, and International Development. He has served in senior technical roles across Africa and Europe, working with governments, international organizations (GIZ, EU), NGOs, and private sector clients.

He currently serves as an AI/ML Consultant with Speedykom GmbH, contributing to data and ML engineering on GIZ-sponsored public health and civic-technology initiatives and independently directing an AI training program for CodeTrain Africa, while simultaneously serving as a Data Science Instructor at WorldQuant University, where he delivers AI/ML curriculum and instruction in data science. He holds a Master's in Financial Engineering from WorldQuant University and a Bachelor's in Electrical & Electronics Engineering from Abubakar Tafawa Balewa University.

Core Competencies & Skills

Artificial Intelligence & Data Science

- **Programming Languages:** Python (Advanced), R, OpenCode (AI Coding Agent)
- **Automation:** n8n, Hermes Agent, OpenClaw
- **AI Engineering & LLMOps:** LangChain, DSPy, LLM Deployment, Custom AI Assistant Architecture, AI Agent Design, Retrieval-Augmented Generation (RAG), Pinecone, GPT-4, Llama 2, DeepSeek-R1
- **Machine Learning & Deep Learning:** PyTorch, Scikit-Learn, XGBoost, FastAI, Keras, TensorFlow, CNNs, Transformers, Object Detection, ARMA/GARCH
- **Data Engineering:** Apache Airflow, Hop, DuckDB, Trino, MinIO, ETL Pipelines
- **Data Science Stack:** Pandas, NumPy, Matplotlib, Plotly Dash, Numba
- **Computer Vision:** Image Classification, Disease Detection (Cassava, Pneumonia, Malaria), UAV/Drone Image Analysis
- **NLP & Low-Resource ML:** Masakhane.io Contributor, African Language NLP, Machine Translation

- **Agentic AI Harnesses:** Claude Code, Claude Design, Hermes, Pi.dev, OpenCode,

Technical Infrastructure & DevOps

- **Backend & APIs:** FastAPI, Uvicorn, Webhooks, Telegram API, WhatsApp Business API
- **Data Visualization:** Streamlit, Dash, Apache Superset, Custom JavaScript Dashboards
- **Cloud & DevOps:** Git, GitHub, Docker, Hetzner Cloud, Hetzner VPS, Vercel, Render, Linux Server Provisioning & Setup
- **Databases:** MySQL, MongoDB, DuckDB, Pinecone (Vector), Qdrant, Supabase
- **Operating Systems:** Windows, WSL2, Linux
- **Development Environments:** VS Code, NeoVim, RStudio, Jupyter
- **AI Harnesses:** Claude Code, OpenCode, Pi, Hermes Agent
- **Documentation:** Quarto, Markdown, Typst, LaTeX
- **Office Suite:** Microsoft Word, PowerPoint, Excel

International Development & Consulting

- **Project Management:** Monitoring & Evaluation (M&E), Stakeholder Management, Donor Reporting
 - **International Agencies:** Direct project experience with GIZ; familiarity with EU frameworks
 - **Training & Capacity Building:** Curriculum Development, Technical Training, Train-the-Trainer
 - **Regional Expertise:** Nigeria, Ethiopia, Ghana, West Africa, East Africa
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Professional Experience

AI/ML Consultant | Speedykom GmbH (GIZ Sponsored Programs)

Location: Germany / Africa (Remote/On-site) | **Dates:** October 2025 – Present

Ricky contributes to data and ML engineering across Speedykom's GIZ-sponsored AI initiatives in Africa, and independently directed the CodeTrain Africa AI curriculum program in Ghana.

AI Curriculum Leadership (CodeTrain Africa / GIZ Ghana) - *Led*

- **Directed a comprehensive 23-day GIZ-sponsored AI training program** with CodeTrain Africa in Ghana.
- **Developed the full curriculum** covering Python Basics, Data Analysis (Pandas), Machine Learning (Scikit-Learn), Deep Learning (PyTorch), and AI Orchestration.
- **Instructed developers** in advanced AI/ML concepts, building a pipeline of job-ready AI talent in Ghana.
- **Led a 10-day Train-the-Trainer workshop**, empowering local instructors to scale AI education independently.

Husika Platform — TTS & Data Engineering (IGAD/ICPAC Region) - *Contributed*

- **Contributed to ML implementation** for Husika’s text-to-speech engine, a multilingual early-warning and civic education platform built with GIZ, IGAD/ICPAC, and NGO consortia (DCA, LPI, DRC), serving 10,000+ citizens across IGAD borderlands.
- **Contributed to designing a hybrid TTS pipeline** combining Twilio Programmable Voice telephony with an offline-capable eSpeak NG fallback on Android, ensuring alert delivery in low-connectivity areas.
- **Contributed to deploying self-hosted neural speech microservices** (Meta MMS, Coqui TTS) and building an 8-step low-resource speech synthesis pipeline with ASR-based data cleaning (OpenAI Whisper, Vosk).
- **Contributed to benchmarking model architectures** for custom VITS2/Matcha-TTS models across five tonal Nilotic languages (Turkana, Karamojong, Pokot, Nuer, Dinka), using a “Joint-then-Fine-tune” training framework that cut GPU costs threefold.

Healthcare Data Engineering (ZHSF - Zanzibar Health Services Fund) - *Contributed*

- **Contributed to architecting automated EMR (Electronic Medical Records) and medical claims reconciliation workflows**, replacing manual reconciliation with a modern data stack.
- **Contributed to building the data pipeline** on **n8n** (workflow automation), **Supabase** (backend), **Qdrant** (vector search for semantic medical document retrieval), and **PaddleOCR** (OCR for handwritten medical records).
- Contributed to automated processing and analysis of unstructured medical data, applying knowledge of **DHIS2** (District Health Information Software) and **RMNCAH** (Reproductive, Maternal, Newborn, Child, and Adolescent Health) indicators to the pipeline design.

Data Pipelines & Visualization (ICGLR - International Conference on the Great Lakes Region) - *Contributed*

- **Contributed to building ETL pipelines** using Apache Airflow, Hop, DuckDB, Trino, and MinIO for the Regional Mineral Data Platform.
- Contributed to creating **interactive dashboards** using Apache Superset and custom JavaScript solutions for data visualization and reporting.

Public Health AI & Capacity Building (IGAD Region) - *Contributed*

- **Contributed as AI Specialist** to a GIZ-sponsored initiative training IGAD (Intergovernmental Authority on Development) policymakers on Large Language Models (LLMs) and predictive modeling for malaria surveillance.
- Contributed to translating complex data insights for non-technical policymakers and stakeholders.
- Contributed to developing custom AI assistants and visualization dashboards to communicate epidemiological data effectively.

Engineering Practices

- Writes self-contained, modular, and tested (unit/integration) code across data pipelines and ML components, with PR-based review and documented design rationale.

- Uses AI-assisted development tools deliberately and critically, maintaining full ownership and understanding of all submitted work.

Data Science Instructor / Curriculum Developer | WorldQuant University

Location: Remote | **Dates:** March 2022 – Present

Ricky instructs and develops WorldQuant University's AI/ML curriculum, focusing on practical, project-based learning for students globally.

- **Curriculum Development:** Contributed to the development of AI/ML modules focused on practical, project-based learning.
- **Instruction:** Guided learners through projects using Pandas, Matplotlib, and Scikit-Learn.
- **Predictive Modeling:** Taught students to build predictive models including XGBoost and Random Forests for real-world applications.
- **Deep Learning:** Developed and taught advanced modules on PyTorch, Transformers, and Generative AI.
- **Computer Vision:** Covered Convolutional Neural Networks (CNNs) for image classification and object detection.
- **Time Series & Financial Modeling:** Taught ARMA/GARCH models and time series analysis for real-world problems. Students developed skills in data pipelines, imbalanced data handling, and visualization.
- **Training Materials:** Developed comprehensive training materials and instructional videos on ML/AI topics. Developing course materials on NLP and building large language models to assist students in querying study materials.
- **African Context Projects:** Designed courses with a strong focus on real-world data from Africa, including:
 - Air quality analysis project in **Nairobi, Kenya**
 - Crop disease classification project in **Uganda**
- **Ethical AI:** Taught ethical considerations in AI, emphasizing responsible model building and environmental impact.
- **End-to-End Solutions:** Emphasized the development of complete AI solutions, from dashboard creation with Plotly Dash to API deployment and version control with Git.

GIZ Consultant | Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Location: Nigeria & Ethiopia | **Dates:** 2019 – 2023

Engaged directly by GIZ across multiple programs in Nigeria and Ethiopia, spanning technical advisory, capacity building, and development consulting for donor-funded initiatives.

- **Team Lead for GIZ EnDev Ethiopia**, an improved cook-stove (ICS) dissemination program: evaluated a Result-Based Financing (RBF) mechanism, developed end-user finance and payment

systems for sustainable energy products, and guided data processing and financial sector analysis for refugee and host communities in the Gambella region (2022, 80 days).

- **Consultant on GIZ's Energy Solutions for Displacement Settings (ESDS)** program, Ethiopia: conducted financial sector analysis and adapted international best practices to the refugee/displacement context, enabling local consultants to design context-appropriate interventions such as cash-based support mechanisms.
 - **Consultant with GIZ GmbH in Nigeria**, supporting technical oversight and quality assurance for donor-funded solar deployments in displacement-affected communities in Adamawa and Borno States.
 - Supported local consultants throughout research processes across engagements — from developing research tools and questionnaires to data analysis and professional report writing — and facilitated communication between local and international teams.
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Nigeria Experience | Data Science, AI & Community Development

Location: Abuja & North-East Nigeria | **Dates:** 2001 – 2023

Founded and led Siseng Consulting LTD, a multidisciplinary consulting firm driving data analytics and AI application projects for government, NGO, and private-sector clients, alongside earlier community development and program coordination work across Nigeria.

Data Science & AI (Siseng Consulting LTD, 2017–2023)

- **Developed web apps using Deep Learning** (Fastai/PyTorch) for image classification to detect cassava plant diseases, pneumonia in chest X-rays, and malaria in blood sample images — building end-to-end ML pipelines from data collection to deployment.
- **Designed computer vision and AI inspection systems** for analyzing UAV/drone imagery and infrastructure site images, annotating faults and supporting predictive maintenance reporting.
- **Worked with Government medical data** on prescription drugs, applying statistical analysis to identify unusual prescribing patterns linked to known opioids, for public health policy intervention.
- **Developed RAG and LLM applications**, including a Question-and-Answer chatbot and an intelligent CV parser, combining ML models with RAG pipelines (LangChain, Pinecone, GPT-3, Llama 2).
- **Worked with time series and financial data**, building backtesting applications for algorithmic trading and completing optimization projects (Gradient Descent, Monte Carlo methods) as part of the MScFE program.
- **Contributor and member of Masakhane.io**, an open-source NLP research effort for African languages, including research on an AI chatbot for emergency health services in English, Hausa, and other Nigerian languages.
- **Coordinated a global Saturday AI meetup (“AI6”)** in Abuja and ran a Python/Data Science coaching program; advised and mentored a startup studio.

Community & Program Development (Great Commission Movement of Nigeria, 2001–2005)

- **Coordinated a network of student development practitioners** across university campuses in North-Eastern Nigeria (Yola, Maiduguri, Bauchi, Mubi, Yobe), including designing the monitoring and evaluation framework for campus-level projects.
 - **Served as a resource person** for capacity building during national and international student retreats, and represented the regional project coordinator in an acting capacity.
 - **Ensured quarterly reporting** to project stakeholders and funders, and jointly planned regional and international workshops and conferences across Nigeria and Accra, Ghana.
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Education

Academic Qualifications

Institution	Degree	Field of Study	Dates
WorldQuant University (Louisiana, USA)	Master of Science (MSc)	Financial Engineering	2018 – 2021
Abubakar Tafawa Balewa University (Bauchi, Nigeria)	Bachelor of Engineering (B.Eng.)	Electrical & Electronics Engineering	1995 – 2000

Professional Certifications

Year	Certification	Issuing Organization
2022	Certificate in Python for Algo Trading	Saarland University of Applied Sciences, Germany
2019	Monitoring and Evaluation Training (Certificate No.:PF/00331)	Piston & Fusion
2019	Applied Data Science Module (Unit I: Scientific Computing & Python for Data Science; Unit II: Machine Learning)	WorldQuant University in partnership with Data Incubator
2019	Farm Data Management, Sharing and Services for Agriculture Development	FAO (Food and Agriculture Organization of the United Nations)
2018	Diversity and International Fellowships for Deep Learning	fast.ai (University of San Francisco Data Institute)
2012	USAID Microlinks Value Chain Basic Training	USAID

Year	Certification	Issuing Organization
2004	Sharpening your Interpersonal Skills	Jos, Nigeria

Publications & Research Contributions

- 1. Participatory Research for Low-resourced Machine Translation: A Case Study in African Languages**
 - Co-authored research paper on Low-Resource Machine Translation.
 - Contributed to advancing NLP capabilities for African languages.
- 2. AfriMTE and AfriCOMET: Empowering COMET to Embrace Under-resourced African Languages**
 - Contributed to the development of machine translation evaluation benchmarks for African languages.
 - Supported the integration of low-resource languages into modern NLP frameworks.
- 3. Berom-English Corpus (Ongoing)**
 - Developing the Berom-English Corpus to preserve and expand this under-resourced Nigerian language.
 - Committed to language preservation and accessibility through computational linguistics.

Language Proficiency

Language	Reading	Speaking	Writing
English (Native)	C2 - Expert	C2 - Expert	C2 - Expert
Hausa	B2 - Upper Intermediate	B2 - Upper Intermediate	B2 - Upper Intermediate
German	A2 - Elementary	A2 - Elementary	A2 - Elementary
Berom	B1 - Intermediate	B1 - Intermediate	B1 - Intermediate
French	A1 - Beginner	A1 - Beginner	A1 - Beginner

References

Available upon request.