Newton Mwai, PhD

AI RESEARCH & DEVELOPMENT

Gothenburg, Sweden | nkinyanj[at]alumni.cmu.edu
linkedin.com/in/newtonmwai/

PROFILE

Over six years of machine learning research and development, from research at Chalmers, IBM Research and Microsoft Research, published at ICML, TMLR and MICCAI, to building and running passo.news, an AI news platform. Meticulous with complex data, with an eye for the factors that actually decide an outcome, and used to taking an idea from a first experiment to a tested, working system, both independently and within cross-functional teams. Quietly determined and technically ambitious, and most at home designing adaptive solutions in settings that keep changing, guided by a commitment to practical and trustworthy machine learning that creates tangible business value.

SKILLS

Machine learning: Deep learning, NLP, computer vision, reinforcement learning and bandits, causal inference, off-policy evaluation, missing-data methods, PyTorch, scikit-learn

LLM systems: Multi-step agents, retrieval-augmented generation (RAG), vector search, embeddings, prompt engineering, evaluation harnesses

Engineering: Python, SQL, APIs, data pipelines, MongoDB, Redis, Azure, Docker, CI/CD, Git, Linux, Bash, SLURM

R&D practice: Prototyping, experimental design, simulation and benchmarking, sensitivity analysis, reproducible research code, technical writing, teaching and mentorship, vendor and client coordination

EXPERIENCE

Chalmers University of Technology — Gothenburg, Sweden
PhD Researcher — Machine Learning — Aug 2020 — Oct 2025

- Developed bandit algorithms that use historical and observational data to find the best decision for an individual in fewer trials, published in TMLR (2023, 2026) and at EWRL 2025.
- Co-developed prediction models that learn to avoid depending on missing inputs, keeping predictions reliable on incomplete data without imputation (ICML 2025).
- Built ADCB, an open-source Python/PyTorch simulator for benchmarking causal-effect estimators on Alzheimer's disease data (CHIL 2022), and extended banditpylib with new algorithms and evaluation workflows.
- Ran large-scale experiments with SLURM on Swedish national supercomputing infrastructure, comparing against baselines and testing how sensitive results were to data and modelling assumptions.
- Taught applied ML, ML for NLP, data science and AI systems design as a teaching assistant for five years, and supervised a two-student master's thesis that led to a co-authored journal paper.

passo.news — Gothenburg, Sweden
Founder & Sole Engineer — Jan 2024 — Sep 2025

- Built and ran an AI-powered news platform from first prototype to 12,000+ subscribers, owning architecture, implementation, Azure deployment and operations; selected for Microsoft for Startups.
- Implemented multi-step LLM agents for content processing, with RAG and vector search for semantic retrieval over a continuously growing news corpus, connected to the product through APIs.
- Wrote offline evaluation harnesses and ran online experiments on agent output, ranking and recommendation quality, applying off-policy evaluation methods from the research to test changes before and after release.
- Built ingestion pipelines that normalised heterogeneous news sources into MongoDB, with Redis-backed serving under 100 ms, and balanced output quality, latency, reliability and cloud cost as usage grew.
- Used reader behaviour data to decide what to build next and when a feature had enough evidence behind it to ship.

Microsoft Research New York, United States (remote)
Contributor — Reinforcement Learning Open Source Fest Apr 2020 — Aug 2020

- Implemented off-policy estimators (IPS, doubly robust, pseudo-inverse) in Vowpal Wabbit, so users can evaluate a new decision policy on previously logged data instead of live traffic.
- Built a shared comparison interface and validation tests with Microsoft Research scientists, making the estimators straightforward to benchmark against each other.

IBM Research Nairobi, Kenya
Research Intern May 2019 — Sep 2019

- Built an evaluation pipeline that measured dermatology classifier performance across skin-tone groups, exposing gaps hidden by aggregate accuracy; trained Mask R-CNN, ResNet and DenseNet in PyTorch.
- Work published at MICCAI 2020 (156 citations) and as a spotlight at the NeurIPS 2019 Fair ML for Health workshop, in collaboration with researchers in Nairobi and New York.

Adtel / Jamii Telecom Nairobi, Kenya
Software & Infrastructure Engineer Dec 2016 — Jul 2018

- Led the rollout of a contactless access-control platform across the 13-floor Jamii Towers, coordinating vendors, system integration and the onboarding of seven tenant companies.
- Developed and supported production software for mobile payments, bulk SMS, USSD and enterprise services, maintaining Linux servers, SQL databases and network monitoring.

EDUCATION

Chalmers University of Technology Gothenburg, Sweden
PhD in Computer Science & Engineering (WASP) Oct 2025
Research: sequential decision-making, multi-armed bandits, causal inference, missing data

Carnegie Mellon University Kigali, Rwanda / Pittsburgh, United States
MS in Electrical & Computer Engineering Dec 2019
Specialisation: Machine Learning and Data Science

Dedan Kimathi University of Technology Nyeri, Kenya
BSc in Electrical & Electronic Engineering 2016
Also awarded BSc in Telecommunication & Information Engineering

SELECTED PUBLICATIONS

- *Identifiable latent bandits: Leveraging observational data for personalized decision-making*. TMLR, 2026.
- *Understanding exploration in bandits with switching constraints: A batched approach in fixed-confidence pure exploration*. EWRL, 2025.
- *Fast treatment personalization with latent bandits in fixed-confidence pure exploration*. TMLR, 2023.
- *ADCB: An Alzheimer's disease simulator for benchmarking observational estimators of causal effects.* CHIL (PMLR), 2022.
- *Fairness of classifiers across skin tones in dermatology*. MICCAI, 2020. (156 citations)

300+ citations in total. Full list on Google Scholar

ADDITIONAL

Leadership: Representative, WASP PhD Student Council (Nov 2022 — Mar 2025), representing 400+ doctoral students across Swedish universities to WASP and university leadership

Peer review: TMLR, AISTATS, AIES, ML4H and CHIL

Invited talks: RISE Learning Machines Seminar (2025), IBM Research Nairobi (2025), Nippon Medical School, Tokyo (2024)

Languages: English (fluent), Swedish (intermediate), Swahili and Kikuyu (native)

Work authorisation: Swedish residence permit with full right to work