

MARDIYYAH ODUWOLE

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EDUCATION

B.Sc Computer Science, National Open University of Nigeria

2020-2024

B.Ed Chemistry, University of Ibadan

2017-2021

RESEARCH EXPERIENCE

Independent Researcher

ML Collective

- **Co-Lead Investigator**

Africaption: Establishing a New Paradigm for Image Captioning in African Languages

In Submission

- Summary: Developed a dataset of image-text pairs across a diverse set of African languages and trained the first image captioning model for 19 distinct African languages. This project releases a multimodal dataset with 4x coverage of African languages over the current available datasets.

- **Lead Investigator**

From Scarcity to Efficiency: Investigating the Effects of Data Augmentation on African Machine Translation
In Submission

- Summary: Investigated the impact of switch-out and sentence concatenation data augmentation techniques on machine translation for underresourced African languages, addressing the challenges posed by linguistic diversity and data scarcity.

- **Co-Lead Investigator**

What Happens When Small Is Made Smaller? Exploring the Impact of Compression on Small Data Pretrained Language Models
AfricaNLP Workshop, ICLR 2024

- Collaborators: Steven Kolawole (Carnegie Mellon University), Busayo Awobade (ML Collective)
- Summary: Examined the impact of model compression on model size, inference time, and performance metrics beyond accuracy for low-resource language models. We identified compressed models' efficiency-accuracy trade-off and generalisation capabilities by testing various compression methods such as pruning, knowledge distillation, and quantization on a small-data language model, AfriBERTa. Overall, we provided insights into the effectiveness of different compression techniques on low-resource language models.

- **Contributor**

A robust regularized extreme learning machine for regression problems based on a self-adaptive accelerated extra-gradient algorithm.
pre-print available on arxiv

- Advisors: Lateef Jolaoso (Southampton University), Muideen Adegoke (University of Hertfordshire)
- Summary: In this paper, we solved the minimization problem from a variational inequalities perspective, giving rise to improved algorithms that are more efficient than the FISTA. A fast general extra-gradient algorithm, a form of the first-order algorithm, is developed with inertial acceleration techniques and variable stepsize, updated at every iteration. The proposed algorithm's strong convergence and linear convergence rate are established under mild conditions.

Independent Researcher

Masakhane

- **Contributor**

MasakhaNEWS: News Topic Classification for African languages

IJCAI-AACL, 2023

- Collaborators: Adelani David Ifeoluwa, Odunayo Ogundepo, Marek Masiak, Israel Abebe Azime, Akintunde Oladipo et al.

- Summary: We introduce MasakhaNEWS, a benchmark for classifying news topics across 16 African languages. Our study includes testing baseline models and refining language models for zero-shot and few-shot learning. ChatGPT excelled in zero-shot classification, achieving a 70 F1 score unsupervised. With minimal training (10 samples per label), we reached an 86.0 F1 score, close to the fully supervised score of 92.6, demonstrating potential advancements in NLP for under-resourced languages.
- Contributor
Masakhane-Afrisenti:Sentiment Analysis using Afro-centric Language Models and Adapters for Low-resource African Languages. *SemEval-2023 Task 12*
 - Collaborators: Tosin Adewumi, Oreen Yousuf, Atnafu Lambebo Tonja, Jesujoba Alabi, et al.
 - Summary: In SemEval-2023’s AfriSenti-SemEval Shared Task 12, we enhanced sentiment classification in 12 African languages using Afro-centric and multilingual pre-trained models and efficient Adapter methods for zero-shot tasks. Our approach significantly improved results in low-resource languages and showed promise in zero-shot learning with minimal resources.

ENGINEERING EXPERIENCE

Accelerator Engineer
SumUP Payment Services

March 2025 - May 2025
London, United Kingdom

- Built and deployed a Retrieval-Augmented Generation (RAG) system that enabled Sales and Customer Success teams to instantly access internal knowledge base, increasing deal closures by 20% and reducing response times from 2 days to 20 minutes.

Machine Learning Engineer
Prunedge Development

June 2022 - June 2023
Lagos, Nigeria

- Developed an opinion mining tool to help our client understand public sentiments towards the 2023 general election with **Flask** and **Tensorflow**.
- Spearheaded a crossfunctional team to build a facial age estimation model using **Pytorch**.
- Built a chatbot using **OpenAI** 'S API and **Flask** that helps reduce the late replies by customer service representatives by **70%**.
- Built an e-commerce recommendation system to help companies leverage customer information based on user and content-based recommendation systems.

Data Scientist
Zummit

August 2021 - March 2022
Lagos & India

- Built an emotion detection model with an accuracy of over **75%** using **TensorFlow** and deployed it to the web application.
- Leveraged **YOLOV5** PyTorch library to train a fake smile detector deployed into a customer relationship management system.

PUBLICATIONS

[6] **Oduwole, Mardiyah**, Oluwatosin Olajide, Jamiu Suleiman, Faith Hunja, Busayo Awobade, Fatimo Adebajo, Comfort Akanni et al. "From Scarcity to Efficiency: Investigating the Effects of Data Augmentation on African Machine Translation." arXiv preprint arXiv:2509.07471 (2025).

[5] **Oduwole, Mardiyah**, Prince Mireku, Fatimo Adebajo, Oluwatosin Olajide, Mahi Aminu Aliyu, and Jekaterina Novikova. "AFRICAPTION: Establishing a New Paradigm for Image Captioning in African Languages." arXiv preprint arXiv:2510.17405 (2025).

[4] Awobade, Busayo, **Mardiyah Oduwole**, and Steven Kolawole. "What Happens When Small Is Made Smaller? Exploring the Impact of Compression on Small Data Pretrained Language Models." arXiv preprint arXiv:2404.04759 (2024).

[3] Adegoke, Muideen, Lateef O. Jolaoso, and **Mardiyyah Oduwole**. "A robust regularized extreme learning machine for regression problems based on self-adaptive accelerated extra-gradient algorithm." arXiv preprint arXiv:2401.15425 (2024).

[2] Azime, Israel Abebe..., **Mardiyyah Oduwole** et al. "Masakhane-Afrisenti at SemEval-2023 Task 12: Sentiment Analysis using Afro-centric Language Models and Adapters for Low-Resource African Languages." arXiv preprint arXiv:2304.06459 (2023).

[1] Adelani, David Ifeoluwa..., **Mardiyyah Oduwole** et al. "Masakhanews: News topic classification for African languages." arXiv preprint arXiv:2304.09972 (2023).

ACCOMPLISHMENTS, AWARDS, RECOGNITION AND FELLOWSHIPS

- Winner, poster award, Deep Learning Indaba 2023: Showcased my research work, "What happens when small is made smaller", at the 2023 edition of the Deep Learning Indaba and won an award for this.
- Winner, Ideathon award, Deep Learning Indaba 2022: Participated in an ideathon challenge at the 2022 edition of the Deep Learning Indaba. My teammates and I were one of the 10 teams that got the award. The award came with mentorship from top researchers at Google and compute from the CURE team.
- Top 10 female data scientists in Nigeria. 2020 & 2021: Participated in Data Science Nigeria AI Bootcamp Qualification hackathon 2020 & 2021. Qualified as one of the top 10 female participants out of 400 qualified data scientists.

LEADERSHIP AND COMMUNITY SERVICE

Reviewer Tiny Papers, International Conference on Learning Representations	2023, 2024
Co-Technical lead, Data Science/ML She Code Africa	2022 - 2024
Data Science Mentor Pan African Women Empowerment Network, Pydata Global	2022 - 2022
Core-team Member & Technical Facilitator Data Science Nigeria	2021 - 2022