

# ABRAHAM TOLUWASE OWODUNNI

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## RESEARCH INTEREST

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Machine Learning Researcher with 2 years+ experience in conducting cutting-edge research and developing novel algorithms that can effectively address real-world challenges. My research interests are in low-resource NLP, efficient ML, Multilinguality and Speech. I am now seeking industry roles where I can work on impactful research and apply my expertise to solve challenging problems that will advance the state of AI.

## PUBLICATIONS

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- **Owodunni A.T**, et al. Advancing African Accented Clinical Speech Recognition with Generative and Discriminative Multitask Supervision. *Ongoing work*.
- **Owodunni A.T**, et al. AccentFold: A Linguistic Journey through African Accents for Zero-Shot ASR Adaptation to Target Accents (Under review). *EACL submission*.
- **Owodunni, A.T.** and Emezue, C.C. Koya: A Recommender System for Large Language Model Selection (Under review). *LREC-COLING submission*.
- Turki, A., ... **Owodunni A.T**, et al. MeSH2Matrix: Combining bibliographic metadata and machine learning for biomedical relation classification based on MeSH keywords and PubMed (Under review). *Scientometric journal submission*.
- Ogundepo, O., ... **Owodunni, A.T.**, et al. [Cross-lingual Open-Retrieval Question Answering for African Languages \(2023\)](#). *EMNLP*.
- Oladipo, A., ... **Owodunni, A.T.**, **Adelani, D.I.**, **Lin, J.** Better Quality Pre-training Data and T5 Models for African Languages (2023). *EMNLP*.
- Adelani, D.I., ... **Owodunni, A.T.**, et al. [MasakhaNEWS: News Topic Classification for African languages \(2023\)](#). *IJCNLP-AACL Area Chair Award(Resources and Evaluation)*.
- Leong, C., ... **Owodunni, T.**, et al. [Bloom Library: Multimodal Datasets in 300+ Languages for a Variety of Downstream Tasks \(2022\)](#). *EMNLP*.
- Turki, A., ... **Owodunni A.T**, et al. [Machine learning for healthcare: A bibliometric study of contributions from Africa \(2023\)](#). *Preprint*.

## EXPERIENCE

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**Machine Learning Researcher Engineer** | IntronHealth

Mar. 2023 - Present

- Creating an ASR model with improved performance by 6% on 2.5m training samples that addresses challenges with ASR for African accents using multi-task learning on NER, training data domain and voice activity detection.
- Leading research to improve WER on OOD accents by understudying the relation between African accents and speech data using accent clustering analysis and an informed sampling technique.
- Implementing a custom learning rate scheduler to help overcome a gradient explosion problem while training on very large dataset.
- Organising masterclasses to train over 70 people on how to use build speech technologies.

**Researcher** | Masakhane

May 2022 - Present

- Created baseline models for over 360 languages for several tasks across visual storytelling, language modeling and ASR.
- Built a recommender system that uses token masking to score models compatibility to a given language sample and recommend the model that will perform the most on a given downstream tasks.

- Moderating talks sessions, meetups, presentations, and webinars on NLP.

## **Deep Learning Engineer (Intern) | Zummit Africa**

Oct. 2021 - Apr. 2022

- Built a face detection project using siamese network, one-shot learning, and triplet loss.
- Created a package to detect the presence of life in videos during face detection.
- Led capacity-building sessions and reading groups on Computer Vision.

## **PROJECTS**

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### **Africa LLM Benchmark dataset - Award Google**

- Got awarded \$30,000 for organising the creation of 20,000 QA dataset for health in Africa.

### **NaijaVoices - Award from Lacuna Funds**

- Co-leading the creation of **1500** hours of ASR transcripts and audios from scratch in 3 Nigerian languages.
- Designing systems and platforms for sentence generation and data audio recording.
- Managing a team of 200 people on the project.

### **Omdena Unemployment Project**

- Built a job recommender system to reduce unemployment rate from 33.3% by recommending jobs for graduates.
- Led a team to perform mining and scrape data from LinkedIn.
- Vectorized text of graduates profile and job description using word2vec, CountVectorizer and TFIDF to digits.

### **Conversational AI Chatbot Development**

- Used the RASA NLP framework to build an end-to-end chatbot for a logistics company.
- Performed hyperparameter tuning and used transformer pretrained models like BERT to increase F1 score to 83% from 68%.
- Deployed the chatbot to Okteto Cloud platform with docker and Kubernetes.

## **EDUCATION**

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**Bachelor of Science in Biochemistry**, University of Ilorin, Ilorin

2015 - 2019

**Further Education (MOOC): University of Michigan:** Python Data Structure;

**Deeplearning.ai:** Neural Networks and Deep Learning, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models;

**Datacamp:** Deep Learning Track; **Udacity:** AWS ML Engineer;

**Microsoft:** Azure Machine Learning (AI900 certification).

## **EXTRA-CURRICULAR ACTIVITIES**

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- Volunteer Expert Group Member — National Information Technology Development Agency (NITDA): honourably participated in the design of the National Artificial Intelligence Policy in Nigeria.
- Paper Reviewer at DLI 2023.
- Organizer: ML-Nigeria with over 50 mentees.
- Mentor for M.Sc at the University of Hull.
- DS4H Workshop Organiser at DLI 2022, 2023.
- MLGH Workshop Organiser at ICLR 2023.