Stephen Kiilu

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I am a passionate machine learning researcher with a keen interest in the intersection of machine learning and natural language processing. My focus lies on advancing research within the fields of NLP for health/medicine and computational neuroscience.

EDUCATION

- **African Institute for Mathematical Sciences (AIMS) Senegal** | MSc Machine Intelligence.   **2022 – 2023**
  Graduate program in machine learning sponsored by Google and Meta.
- **African Institute for Mathematical Sciences (AIMS) Rwanda** | MSc Mathematical Sciences.   **2020 – 2021**
  AIMS is a pan-African network of Centers of Excellence for post-graduate training in STEM.
- **Maseno University, Kenya** | BSc Applied Statistics with IT.   **2014 – 2018**

RESEARCH EXPERIENCE

- ***Exploring methods for Adapting (Large) Language Models to Low-Resource Languages.***   **2022 – 2023**
  Advisor - Machel Reid, Research Scientist at Google DeepMind.
- ***Time Series Analysis of Rainfall and Temperature in Rwanda using ARIMA Model.***   **2020 – 2021**
  Advisor - Dr. Viani Djeundje Biatat, University of Edinburgh, UK.

WORK EXPERIENCE

University of Tübingen, Germany | Research Fellow   **Starting April 2024**
Supervisor: Professor Carsten Eickhoff
- Conducted research on Natural Language Processing (NLP) applications within the health and medicine sector, focusing on innovative ways to leverage NLP for healthcare advancements.
- Worked within the Health NLP Lab, led by Professor Carsten Eickhoff, specializing in the mining, representation, and retrieval of large-scale natural language resources.

Chichewa NLP Project, Online | NLP Researcher.   **Oct 2023 – Present**
- Collected, curated, and documented datasets for various NLP tasks in Chichewa.
- Fine-tuned and evaluated large language models (LLMs) for machine translation (MT) tasks.

Crossroads International, Toronto, Canada | Environment and Sustainability Advisor.   **Sept 2022 – April 2023**
Represented Crossroads International in a collaborative mandate with the iSpace Foundation in Ghana, supported by the Global Affairs Canada (GAC) .
- Supported Crossroads International's gender equality and women empowerment programs in Ghana.
- Developed policies that support the 2021-2025 climate action agenda of the iSpace Foundation.
- Conducted training and workshops to build capacity for climate change in communities in Ghana.
- Led the iSpace Foundation's climate change research and outreach activities.

KEY SKILLS

Programming	Python and R.
Frameworks	PyTorch, HF Transformers, JAX, Scikit-Learn.
Software	STATA, SPSS, SQL, Tableau.
Tools	Bash/Zsh, Linux, LaTeX, macOS, Microsoft Office, Windows, BrainLife (neuroimaging).
Communication	Technical writing, data visualization, scientific communication.
Languages	Swahili (native), English (fluent).

PROJECTS

- **Implementing the Hodgkin Huxley Model** | IBRO-Simons Computational Neuroscience Imbizo, Cape Town, South Africa.   **Jan 2024**
- **Decoding Hand Shapes from fMRI Data Using Different Machine Learning Models** | IBRO-Simons Computational Neuroscience Imbizo, Cape Town, South Africa.   **Jan 2024**

- **Decoding the Brain: Statistical Analysis of the Volume of the Human Hippocampus** | African Brain Data Science (ABDS), Lagos, Nigeria. **Dec 2023**
- **Working memory RNN** | TReND Computational Neuroscience and Machine Learning School, Accra, Ghana. **June 2023**
- **Paddy Disease Classification** | African Institute for Mathematical Sciences (AIMS) Senegal. **August 2022**
- **Prediction of COVID using DNA Sequences** | (AIMS) Senegal. **July 2022**
- **Neural Machine Translation (NMT) Hackathon (1st position)** | (AIMS) Senegal. **June 2022**

Workshops & Summer schools

IBRO-Simons Computational Neuroscience Imbizo | Cape Town, South Africa.	**Jan 2024**
African Brain Data Science (ABDS) Academy | Lagos, Nigeria.	**Nov – Dec 2023**
Africa Climate Summit (ACS) 2023 | Nairobi, Kenya.	**Sept 2023**
African Youth Climate Assembly (AYCA) 2023 | Nairobi, Kenya.	**Sept 2023**
TReND Computational Neuroscience and Machine Learning Summer School | Accra, Ghana.	**June 2023**
International Conference on Learning Representations (ICLR) 2023 conference | Kigali, Rwanda (Paper accepted to ICLR 2023 Tiny Papers track).	**May 2023**
Keynote address by the U.S. Vice President Kamala Harris | Black Star Gate, Ghana.	**March 2023**
CIMPA School on Mathematics of Climate Science | AIMS Rwanda, Kigali.	**March 2023**

Honours and Awards

IBRO-Simons Computational Neuroscience Imbizo | Cape Town, South Africa (\$ 6000).	**Aug 2023**
African Brain Data Science (ABDS) | Lagos, Nigeria.	**Aug 2023**
Google Conference Scholarship to attend the ICLR 2023 conference | Kigali, Rwanda.	**April 2023**
ICLR 2023 travel grant award to attend the ICLR conference | Kigali, Rwanda.	**April 2023**
TTReND Computational Neuroscience and Machine Learning Scholarship | Accra, Ghana.	**March 2023**
Google and Meta Scholarship | AMMI-AIMS Senegal.	**Jan 2022**
Mastercard Foundation Scholarship | AIMS Rwanda.	**Aug 2020**

Publications

1. *Malichi, Emmanuel, Marcel Ndengo,* **Stephen Kiilu,** *et al. Fitting Rwanda's Currency Market Returns with the Poisson Compound Model with Normal Inverse Gaussian Jumps. Journal of Financial Risk Management 12, no. 4 (2023): 388-404.*

2. **Stephen Kiilu,** *Machel Reid. Pivot Pre-finetuning for Low Resource MT: A Case Study in Kikamba. International Conference on Learning Representations 2023. ICLR Tiny Papers track.*

3. **Stephen Kiilu,** *2021. Time Series Analysis of Rainfall and Temperature in Rwanda using ARIMA Model.*

Volunteer Activities

Deep Learning Curriculum Content Reviewer | Neuromatch Academy (NMA).	**April – Sept 2023**
Trainer | Teacher Training Program (TTP).	**June 2021**

Presentations and Talks

1. **Building your Career in Data Science: from scratch** | Galois Insights Limited, Kenya. **March 2024**
2. **Natural Language Processing(NLP) and Large Language Models (LLMs)** | Galois Insights Limited, Kenya. **Aug 2023**
3. **Pivot Pre-finetuning for Low Resource MT: A Case Study in Kikamba** | Poster presentation, International Conference on Learning Representations (ICLR) 2023, Rwanda. **May 2023**