WE STILL DO FINE WITH LESS LABELS WHEN DOING NAMED ENTITY RECOGNITION ON AFRICAN LANGUAGES

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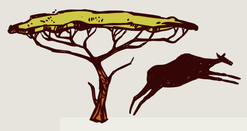


INTRODUCTION

- Transformer models perform well on tasks such as **Named Entity Recognition (NER)** with African languages.
- While this is encouraging, in a low-ressource setting, it would be advangtageous to analyse the performance of models when the quality of the dataset used varies.

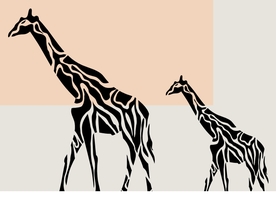
OBJECTIVE

- NER datasets consists of pairs of sentences. The first sentence in each pair is a sentence in any language.
- The other sentence consists of NER tokens that are labels for each word in the first sentence.

- In a low ressource setting, it is hard to find annotators that can provide labels for words in African Languages.
- Therefore, *How is the performance of our NER models affected by the availability of these labels for every sentences?*

METHODOLOGY

- We use 3 languages from the **MasakhaNER** [1] dataset.
  - Swahili
  - Nigerian-Pidgin
  - Kinyarwanda
- For each language, we construct derived dataset where the number of token labels per sentences is capped and the surplus removed.
- For each dataset created, we train a set of NER models and record the **F1-score** on an evaluation set left **un-changed**.
  - BERT
  - RoBERTa
  - Multilingual BERT

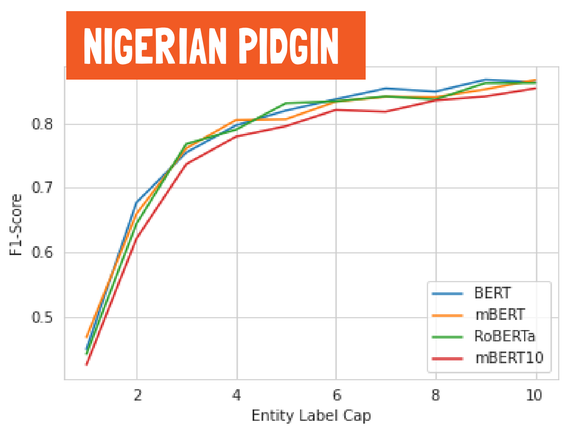


RESULTS & FINDINGS

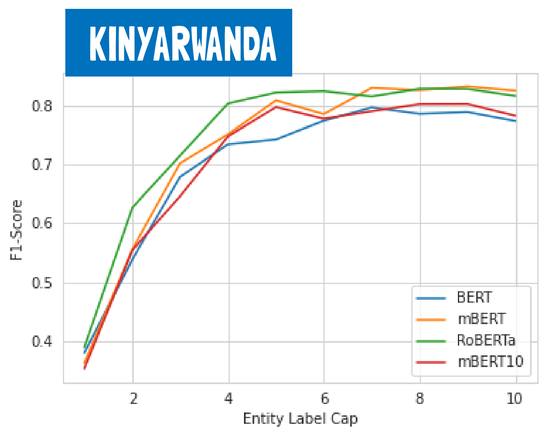
- More labels per sentence does not necessarily mean more performance.
- NER models can surprinsingly perform well with less labels
- Multi-language models perform better in such scenarios

ANALYSIS

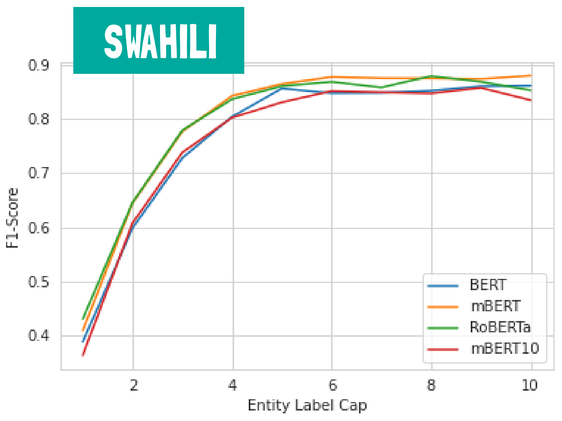
NIGERIAN PIDGIN



KINYARWANDA



SWAHILI



- As we increase the cap from **1** to **10**, the performance benefits reduces.
- There is still some margin of improvement on **Nigerian Pidgin**. Maybe due to its similarity with English which is one of the high-resource languages used during the pre-training of these NER models.

CONCLUSION

A linear increase in the number of labels per sentence does not forcefully lead to a **consistent** linear improvement in the performance of NER models on African Languages.

REFERENCES

1. David et al, **MasakhaNER: Named Entity Recognition for African Languages**. *Transactions of the Association for Computational Linguistics*, 9:1116–1131.

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HELP ME TURN THIS COURSE PROJECT INTO A PAPER?

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