



Natural Language Processing for African Languages in Morocco: Challenges and Opportunities

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Abstract

Natural Language Processing (NLP) has emerged as a critical tool in various fields including media, politics, and social sciences. The integration of NLP with African languages is particularly challenging due to linguistic diversity and resource scarcity. The research methodology involves a comparative analysis of existing NLP frameworks applied to Moroccan African languages. Data collection includes academic literature reviews and expert interviews. Findings indicate that despite significant challenges such as limited linguistic resources and computational infrastructure, there is growing interest in developing tailored NLP solutions for African languages in Morocco. Despite the current limitations, this study highlights opportunities for future research and development in leveraging NLP technologies to enhance communication and social interaction in Moroccan African language contexts. Recommendations include the need for collaborative efforts between academia, industry, and government stakeholders to address resource constraints and promote innovation in NLP applications. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sum}_{i=1}^n \ell(y_i, f_{\theta}(\xi_i)) + \lambda \|\theta\|_2^2$, with performance evaluated using out-of-sample error.

Keywords: *Geographic, Sub-Saharan, Computational Linguistics, Multilingualism, Annotation, Morphology, Parsing*

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