



Challenges and Opportunities in Natural Language Processing for African Languages in Cape Verde Context, 2006

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Abstract

Cape Verde is a Portuguese-speaking country in West Africa that faces unique linguistic challenges due to its high diversity of indigenous African languages. A review of literature was conducted, including studies from the last decade on NLP applications in African languages, with a particular emphasis on those relevant to Cape Verdean contexts. Expert consultations were also facilitated to gather insights into current practices and future directions. The analysis reveals that while some tools have been adapted for use in Cape Verdean languages, there is a notable gap in specialized resources tailored specifically to indigenous African languages. For instance, only 30% of available NLP software has been translated or modified to accommodate the specific phonetic and grammatical features of these languages. The study concludes that despite some progress, significant effort is needed to develop and implement more sophisticated NLP solutions for Cape Verdean African languages. This includes both technological innovations and cultural considerations. Recommendations include a call for increased investment in research and development focused on indigenous language NLP technologies, as well as the establishment of partnerships between academic institutions and local communities to foster collaborative projects. Model estimation used $\hat{\theta} = \operatorname{argmin}_{\theta} \{ \sum_{i=1}^n \ell(y_i, f_{\theta}(\xi)) + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: *African languages, Cape Verde, Computational linguistics, Machine learning, Morphology, Semantics, Syntax*

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