

# Low-Resource Language Enhancement Using Deep Learning Models

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**Abstract:** Low-resource languages face significant challenges in natural language processing due to limited availability of annotated datasets, linguistic tools, and digital resources. This study explores the application of deep learning models to enhance language processing capabilities for low-resource languages. The research focuses on leveraging transfer learning, multilingual pre-trained models, data augmentation techniques, and cross-lingual embeddings to improve tasks such as machine translation, speech recognition, text classification, and language generation. By utilizing neural network architectures including Transformer-based models and sequence-to-sequence learning frameworks, the study demonstrates improved linguistic representation and model performance even with scarce training data. The findings highlight the potential of deep learning approaches to preserve linguistic diversity, promote digital inclusion, and enable the development of accessible language technologies for underrepresented linguistic communities.

**Keywords:** Low-resource languages, Deep learning, Natural Language Processing