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Abstract:

Identifying the Language Present in Text or Image Using Visual Features Training Model Abstract: The present invention relates to a method and system for accurately iden the language(s) present in a given text or image containing text using a multimodal approach that combines textual and visual features. The invention addresses the limita traditional text-based language identification methods, which struggle with short or noisy text, similar languages, and text embedded in images. The proposed method inv training a machine learning model on a dataset consisting of text samples, corresponding images, and language labels. The model architecture comprises two main brancl textual feature extraction branch and a visual feature extraction branch. The textual branch processes the input text and extracts relevant features using techniques such (tokenization, embedding, and neural network layers (e.g., CNNs, LSTMs, transformers). The visual branch processes the input image and extracts visual features related to style, layout, and context using techniques like CNNs or vision transformers. The extracted textual and visual features are then fused using a fusion module, which can em techniques such as concatenation followed by fully-connected layers, attention mechanisms, or multimodal fusion approaches. The fused features are passed to a classific module, which predicts the language label for the input text/image pair using fully-connected layers and a softmax output layer. The model is trained using an iterative prothat involves forward pass, loss calculation, backward pass, and parameter optimization. The training process aims to minimize the discrepancy between predicted and gre truth language labels. The model's performance is validated on a separate validation set, and the best-performing model is selected for testing on unseen data. The invent offers several advantages over existing methods. By leveraging both textual and visual features, it achieves more accurate and robust language identification, especially in challenging scenarios with limited or noisy text. The multimodal approach enables the model to handle diverse text scenarios, including text embedded in images, short te code-switching, and similar languages. The unified machine learning framework allows for training on a wide range of languages and visual styles, making it adaptable to v domains and applications. The proposed language identification method has broad applicability in various fields, such as natural language processing, computer vision, ar multilingual information retrieval. It can be integrated into existing systems and pipelines to enable more effective processing, content management, and user experience increasingly globalized digital landscape.

Complete Specification

Description:IDENTIFYING THE LANGUAGE PRESENT IN TEXT OR IMAGE USING VISUAL FEATURES TRAINING MODEL

Field of Invention:

This invention relates to techniques that combine both textual and visual features to automatically identify the language(s) present in text or images containing text. It fa under the broader domains of:

Natural Language Processing (NLP):

Language identification, Text feature extraction (n-grams, embeddings, language models)

Computer Vision (CV): Image processing, Visual feature extraction (text style, layout, ontext)

Object detection/recognition (text regions)

Machine Learning:

Multimodal learning (fusion of textual and visual features)

Neural network architectures (CNN, RNN, Transformers)

Supervised learning (classification on annotated data)

Background of the Invention:

Language identification is a fundamental task in natural language processing (NLP) that involves automatically determining the language(s) in which a given text is written

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