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ABSTRACT

Topic: Sentiment Analysis Using Natural Language Processing (NLP) Techniques in Python

Sentiment analysis, also known as opinion mining, is an important technique used in natural language processing (NLP) to determine the emotional tone of a piece of text. This research paper examines various sentiment analysis techniques implemented in Python, with a focus on popular libraries such as NLTK, SpaCy, and TextBlob. The study compares different machine learning algorithms like Naive Bayes, Support Vector Machines (SVM), and deep learning approaches to evaluate their effectiveness in accurately predicting sentiments in large text datasets. The analysis covers key preprocessing steps, including tokenization, stop-word removal, and stemming, which are essential for refining input data. Additionally, this research delves into feature extraction methods such as TF-IDF and word embeddings (Word2Vec, GloVe) to understand their impact on model performance. Through a practical case study of sentiment analysis on product reviews, this paper demonstrates the ability of Python-based NLP tools to effectively classify text. The study aims to provide insights into how different techniques influence model accuracy and can be applied in real-world applications, such as customer feedback analysis or social media monitoring.