**Comparative Study of Sentiment Analysis on Text Data Using Various Deep Learning Models**

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**Abstract:**

This paper addresses the need to automate sentiment analysis due to the rising volume of digital textual data. Its primary goal is to analyze sentiment analysis techniques, with a focus on assessing emotional tone in sources like Amazon Product Reviews and IMDb movie reviews. We systematically evaluate the effectiveness of various Natural Language Processing (NLP) and Deep Learning models, such as LSTM, CNN, CNN-LSTM, BERT-, across diverse datasets. We also investigate how the choice of dataset influences model accuracy. Our methodology involves data preprocessing, feature extraction, model selection, and performance assessment through cross-validation. We provide a comprehensive evaluation of sentiment analysis models, considering metrics such as accuracy and F1-score. This study advances sentiment analysis techniques, assists in selecting models for specific applications and datasets, and serves as a valuable resource for future research, deepening our understanding of NLP and deep learning techniques in sentiment analysis.

**Keywords**: Sentiment analysis, Emotional tone, Natural Language Processing (NLP), Deep Learning models, CNN, CNN-LSTM, BERT, LSTM.