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EMOTIBERT: AN ENHANCEMENT OF SENTIMENT ANALYSIS FOR USER REVIEWS

KADIAM VISHNU MURTHY¹, DHINESH S², S. SETHU³

Computer Science & Engineering (AI & DS), Vels Institute of Science Technology and
Advanced Studies (VISTAS), Chennai, India

Abstract

The explosive growth of e-commerce platforms has led to a massive surge in user-generated product reviews, making manual evaluation increasingly impractical for consumers. Many existing sentiment analysis methods struggle to interpret complex linguistic phenomena such as negation, sarcasm, blended opinions, and subtle emotional cues that commonly appear in user-written feedback. This paper presents EmotiBERT, an improved review analysis framework that extends the BERT (Bidirectional Encoder Representations from Transformers) model by integrating Syntax-Enhanced BERT (SynBERT) with affective emotion embeddings derived from domain-oriented lexicons. EmotiBERT applies dependency parsing to model syntactic relationships between words and incorporates emotion-aware token representations to strengthen semantic understanding. These enriched embeddings are combined using attention driven fusion, enabling the model to dynamically focus on tokens that are syntactically and emotionally significant during sentiment prediction. The proposed framework is implemented as a secure web-based application where users can search for products and obtain automated purchase recommendations generated from aggregated review sentiment. Experimental results on benchmark datasets— Amazon Product Reviews, IMDb, and Yelp—show that EmotiBERT achieves classification accuracy above 92%, consistently surpassing standard BERT, BiLSTM, and traditional lexicon-based approaches.

Keywords

Sentiment analysis, EmotiBERT, BERT, SynBERT, emotion embeddings, NLP, e-commerce reviews, dependency parsing, attention mechanisms.