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(54) Title of the invention : ANALYZING E-COMMERCE PRODUCTS DESCRIPTIONS AND REVIEWS FOR QUALITY CLASSIFICATION USING SBERT-BASED SEMANTIC FEATURE EXTRACTION

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(57) Abstract :

ABSTRACT [0018] In the digital commerce landscape, product reviews and descriptions play a pivotal role in shaping customer perceptions and purchase decisions. Analyzing these textual elements not only helps in understanding consumer sentiment but also aids in curating personalized product experiences. With e-commerce platforms offering millions of products, understanding and analyzing unstructured text such as product descriptions, features, and customer reviews has become critical to ensuring quality, trust, and personalized user experiences. This study aims to semantically interpret such textual data to classify product quality and improve recommendation accuracy through a deep learning-based approach. [0019] The proposed system leverages a fine-tuned Sentence-BERT (SBERT) model, renowned for its effectiveness in semantic similarity and contextual understanding. By adapting SBERT to e-commerce domain data, the model generates rich embeddings that encapsulate the semantic essence of products. These embeddings are used to power both quality classification and semantic recommendation functionalities. The approach includes standard data cleaning techniques, text fusion strategies, and sentiment labeling based on user ratings to prepare the dataset for fine-tuning and evaluation. To support scalable and fast similarity retrieval, FAISS (Facebook AI Similarity Search) indexing is applied to the SBERT-generated embeddings. This enables real-time discovery of semantically similar products, addressing limitations found in traditional keyword-based or collaborative filtering methods. In parallel, a Logistic Regression classifier is trained on the embeddings to predict product quality as either good (positive) or bad (negative), combining interpretability with semantic depth.

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