Building Deep-Learning Consumers' Sentiment Signals for Sales Forecasting: A Comparative Study

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Abstract

Sentiment analysis (SA) is a technique that aims to measure the attitudes and opinions of customers by extracting their ideas, preferences, and feelings (Zhu et al., 2020; Liu, 2020). Different methods can perform sentiment extraction, resulting in other signals. Developing an effective signal can better understand consumers' attitudes toward products, leading to more accurate predictions under similar external conditions. Conversely, an ineffective signal can lead to random noise. This paper presents a case study using deep-learning techniques such as Word2vec, LSTM, and BERT to create sentiment signals. These signals are then utilised to predict the sales of products and to comprehend the lag that anticipates market changes. We evaluated our models on a corpus comprising 163,000 tweets related to the Toyota Camry from June 2009 to December 2022. For the same period, we also considered sales volumes of the US market.