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Enhanced Elman spike neural network based sentiment analysis of online product recommendation

Solairaj A. [a,*], Sugitha G. [b], Kavitha G. [b]

[a] Department of Computer Science and Engineering, Nadar Saraswathi College of Engineering and Technology, Vadapudupatti, Theni, India
[b] Department of Computer Science and Engineering, Muthayammal Engineering College (Autonomous), Rasipuram, Namakkal, India

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ABSTRACT

The major task of Natural Language Processing (NLP) is Sentiments Analysis (SA) or Opinion Mining (OM). It captures the opinion, trust, and feelings of every user's about the related products to find whether the attitude of users is positive, negative, or neutral. By this, companies can make necessary changes in the product for customer satisfaction. The majority of the existing approaches on sentiment analysis have inaccurate and takes more time. Therefore, in this manuscript, an Enhanced Elman Spike Neural Network based Sentiment Analysis of Online Product recommendation is proposed (EESNN-SA-OPR). Here, filtering Collaborative (FC) and product to product (P–P) similarity are used as new recommendation systems. The aim of Collaborative Filtering is "to predict the best shops and product–product similarity is to predict the best products". Initially, the datas are taken from Amazon reviews database. Then the input data is pre-processed. The trilateral smoothing filtering (TRSF) is used to remove the content which is no more needed and texts related filtering. After that, the features like manufacturing price (MRP), Manufacturing date (MFD), discounts, offers, ratings in qualities are extracted by using Dominant Gradient Local Ternary Pattern descriptor (DGLTPD) technique. At last, enhanced Elman spike neural network classifies the product recommendation as excellent, good, very good, bad and very bad. The proposed method is executed in MATLAB and its performance is analyzed under some performance metrics, like mean absolute error (MAE), mean squared error (MSE), mean absolute percentage error (MAPE), accuracy, F-Score, recall and precision. The proposed EESNN-SA-OPR method provides 23.14%, 15.96%, 31.54% higher accuracy and 12.33%, 21.31%, 41.09% lower mean absolute error compared with the existing techniques, like Sentiment analysis of online product reviews utilizing DLMNN and future prediction of online product utilizing IANFIS (DLMNN-SA-OPR), a machine learning-based sentiment analysis of online product reviews with new term weighting along feature selection method (LSIBA-ENN-SA-OPR) and Sentiment Analysis on the Reviews of Online Product utilizing Optimized RNN-LSTM along Support Vector Machine (RNN-LSTM-SA-OPR) respectively.

1. Introduction

The better brand selection among the number of brands are available in the market is difficult for consumer [1]. The development of E-Commerce has an impact on consumers' purchasing patterns [2]. Buyers make their decision based on the reviews available in E-Commerce [3]. The product reviews can be found on social networking websites [4]. Social networks have become quite popular in recent years, there is a possibility that as a result of such websites, data proliferation may become unruly in the future [5]. Since every day everyone posting comments, there is a massive increase in internet data and information [6]. So, it is very difficult to exactly extract corresponding information from the Internet [7]. Analysis of the positive and negative opinions about each product that can be found via SA will help consumers and manufacturers reach their goals [8–12]. SA represents the computational process of identifying and classifying various opinions displayed in text. The sentiment analysis is nothing but "opinion mining", its intention is "to determine the human attitude (positive, negative, neutral) regarding the particular item". The connections between sentiment analysis and product design are still largely unexplored despite the significant improvements of sentiment analysis in other domains. Sentiment analysis is a main task on NLP. SA can be used to assess whether a critic is in positive or negative attitude [13]. Where, every product reviews are summarized and sentiments are categorized [14]. SA assesses the opinions of people about products, companies, services, and organization [15,16]. The connections amid the SA and product

* Corresponding author.
E-mail address: profsolairaja001@gmail.com (Solairaj A.).

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