

INVESTIGATION WITH OPINION MINING ON SOCIAL MEDIA TEXTS BY EMPLOYING MACHINE INTELLIGENCE APPROACHES

1. INTRODUCTION

The emergence of social media network aids every user to provide their opinions freely and thus becomes an influential platform to raise their voice. People also use it to provide their valuable thoughts, reviews, ratings, etc., on the social media platforms like Twitter, Facebook, and YouTube (Victoria and Chuard 2012). Hence most business providers gather the reviews and ratings from these sites to enhance their products if it is necessary.

Social media data are not only used to hone the business but also used for political purposes. Most of the political parties use social media as an important platform to conduct their campaigns. In this smart digital world, most people depend on social media, and hence the campaigns of political leaders easily reach the people from each nook and corner (Housley et al. 2018).

Sentiment analysis or opinion mining is the process of extracting opinions from the social media network. The opinions are then classified on the basis of emotions (sad, happy, angry, confused, etc.), aspect-based (product reviews), polarity-based (“moderate, neutral, low extreme, high extreme”), and language-based (Liu 2010). Moreover, the sentiment analysis is classified into five tiers: (i) word tier, (ii) sentence tier, (iii) document tier, (iv) aspect tier, and (v) concept tier (Lal et al. 2020). The polarities of the datasets are analyzed in the first three tiers.

Word tier analyzes the polarity of affective words and subjected sentence polarities are analyzed in sentence tier. However, the polarities of entire documents are analyzed in the document tier. The features are extracted from the datasets at the aspect tier. Further, the concept tier is used to group the words with the same opinion as to the same concept, hence the name concept tier. Several research works are

conducted in this sentiment analysis to classify the data on the basis of sentiments. Nevertheless, the optimized accuracy is still not obtained.

Understanding the necessity of the opinion mining social media, this research work presents three research solutions, where each work focuses to analyse the social media data and categorize the data based upon its content. This research work aims to present opinion mining schemes based on machine learning approaches.

The performances of all the proposed techniques are to be compared with the existing approaches and the attained experimental results are convincing. The following section reviews the recent literature concerning opinion mining in social media.

2. RELATED LITERATURE

This section aims to provide the related works in the existing literature with regard to opinion mining in social media.

The crucial role of social media and opinion mining of expatriate adjustment was proposed by Lal et al. (2020). The cross-cultural environmental factors were identified in which the social media contains own important role to adjust the expatriate. The flows of ideas and opinions are provided by ubiquitous and affordable online communications. The important expatriate's adjustment such as support needs, emotional, instrumental support needs, support availability, socio-emotional, psychological adjustment, work adjustment, interaction adjustment, and general adjustment are pointed out.

The Convolutional Neural Networks (CNN) and emotion cognition was proposed by Wu et al. (2020) for social media opinion summarization. The rule-based emotion export mechanism was offered with Ortony-Clore-Collins (OCC) model. The OCC-based sentiment classification rule library compares the accuracy of manual sentiment annotation. The efficacy of the CNN model is demonstrated using the experimental outputs from examining three real-world microblog datasets.

The whale optimization algorithm and social impact theory-based optimization were suggested by Akyol et al. (2020) for sentiment classification in online social media. In order to obtain effective results, integrate the memory feature into Social Impact Theory oriented mechanism. This model demonstrated better results compared to the Amazon, Polarity, and IMDB data sets. The sentiment analysis problems are effectively classified using various performance measures such as “accuracy, specificity, sensitivity, precision, recall, MCC, and F-Measure”.

Textual reviews are utilized to carry out opinion mining and classification of sentiment using machine learning techniques and a fuzzy approach, which was proposed by Krishna et al. (2018). The sentiment valuation categorizes opinionated text into negative and positive classes. The sense relates a sentiment analysis and opinion mining in which the opening mining contract with opinions summarizing and analysis.

The opinionated text into negative and positive are classified using sentiment analysis. The experimental results demonstrated better classification accuracy but it needs a reliability improvement during fake review detection or opinion spam detection, as discussed in the works of (Li et al. 2020; Akyol and Bilal 2020; Alam et al. 2020; Asif et al. 2020; Garg et al. 2020; Garg et al. 2019; Chiba et al. 2018).

Hence, this section discusses the related works with respect to social media data analysis and the following section outlines the motivational idea of this research work.

3. MOTIVATION OF THE RESEARCH

The utilization of social media is quite increasing every day and it acts as an open platform for the users to share their knowledge, ideas, opinions, experience and so on. As social media is utilized by common man, the communication gap is reduced considerably. Useful patterns can be formed, when the data shared in the social media is mined properly. For instance, the drawbacks of a commercial product cited by the common users can be taken into account by the manufacturer and the product can be enhanced. Similarly, numerous benefits can be attained by mining the

social media data. This work recognizes the significance of this research area and contributes three solutions for categorising the social media text based on the content.

4. RESEARCH OBJECTIVES

As mentioned, social media data analysis provides numerous benefits for many top level entities, as the communication gap is reduced. However, social media data analysis is quite difficult, as the communication is informal and the volume of data is huge. Owing to the benefits of social media data analysis, this research work proposes three research solutions for the same. Advanced data mining techniques are to be employed to address the research problem.

The central goal of this work is to categorise the social media data with respect to its matter. The research objective is attained by segregating the complete work into three phases and their objectives are as follows.

- To compare the proposed approaches with the existing research solutions in terms of benchmark performance measures such as accuracy, precision and recall rates.
- To enhance the performance of opinion mining approach by reducing the false positive and false negative rates.

This section highlights the research objectives and the following section points out the expected outcomes.

5. EXPECTED OUTCOMES

The expected outcomes of this research work are listed below.

- To attain better accuracy rates in terms of decision making by considering the user opinions.
- To minimize false positive and false negative rates, such that the opinion mining process is considered reliable and paves way for achieving the goal.

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