

Sentiment Classification of Movie Reviews Using Korean Sentiment Dictionary

Heeryon Cho and Sang-Hyun Choi*

BK21Plus Big Data Servis Model Optimization Team
Department of Management Information Systems
Chungbuk National University
Cheongju, South Korea
heeryon@chungbuk.ac.kr, chois@chungbuk.ac.kr

Abstract. While there exists a large volume of research on sentiment classification of English customer reviews using English sentiment dictionaries, there are few researches on classifying sentiment of Korean customer reviews using Korean sentiment dictionaries. We use more than a thirteen thousand-word movie domain Korean sentiment dictionary to classify positive/negative sentiment of online movie reviews written in Korean. The binary sentiment classification performance of the constructed sentiment dictionary was 80.7% confirming the effectiveness of the Korean sentiment dictionary and the dictionary-based sentiment classification method.

Keywords: Movie Reviews, Sentiment Classification, Korean Sentiment Dictionary

1 Introduction

A growing interest in the customer-generated opinion data gave rise to a large volume of research on opinion mining and sentiment analysis [1, 2]. While there are many works on dictionary-based sentiment classification of English customer product reviews, there are few researches on dictionary-based sentiment classification of Korean customer product reviews. In this paper, we present a method of classifying positive/negative sentiment in Korean movie reviews using a Korean sentiment dictionary. In order to do this, we need a Korean sentiment dictionary. While there are many English sentiment dictionaries available (e.g., SentiWordNet [3], Opinion Lexicon [4], General Inquirer [5], etc.), there are very few Korean sentiment dictionaries available to the best of our knowledge. Therefore, in this paper we construct a movie domain Korean sentiment dictionary using online movie reviews written in Korean which contain movie ratings. We classify the positive/negative movie reviews using the movie domain Korean sentiment dictionary by calculating the arithmetic mean of the dictionary-matched review words and comparing it to the preset threshold. We report the result of the sentiment classification experiment.

* Corresponding author, +82-43-261-3742.

2 Experiment

We used 135,082-word movie domain Korean sentiment dictionary to classify the positive/negative sentiment in movie reviews written in Korean. The total number of movie reviews used in the dictionary-based sentiment classification experiment was 173,491 in which the number of positive and negative reviews were 143,716 and 29,775, respectively. Each movie review was preprocessed using a Korean morphological analyzer [6] to extract word tokens. Then, the overall sentiment value of the movie review was calculated by finding the matched movie review words from the Korean sentiment dictionary and calculating the arithmetic mean of the matched sentiment values. The movie review was judged as positive if the mean sentiment value was greater than the preset threshold and as negative, otherwise. Table 1 shows the positive accuracy (POS_ACC), negative accuracy (NEG_ACC) and the balanced accuracy (BAL_ACC) of the sentiment classification experiment across different thresholds with intervals of 0.01 (the horizontal axis) on the movie review test data.

Table 1. Positive accuracy (POS_ACC), negative accuracy (NEG_ACC), and balanced accuracy (BAL_ACC) of sentiment classification experiment across different thresholds.

THRESHOLD	POS_ACC	NEG_ACC	BAL_ACC
0.00	0.938	0.446	0.692
0.01	0.932	0.481	0.706
0.02	0.925	0.517	0.721
0.03	0.917	0.556	0.737
0.04	0.907	0.593	0.750
0.05	0.896	0.634	0.765
0.06	0.881	0.674	0.778
0.07	0.865	0.711	0.788
0.08	0.845	0.750	0.798
0.09	0.824	0.783	0.804
0.10	0.798	0.815	0.807
0.11	0.771	0.843	0.807
0.12	0.738	0.869	0.803
0.13	0.702	0.890	0.796
0.14	0.662	0.909	0.786
0.15	0.621	0.924	0.772
0.16	0.578	0.937	0.757
0.17	0.535	0.947	0.741
0.18	0.491	0.955	0.723
0.19	0.447	0.962	0.705
0.20	0.405	0.968	0.687
0.21	0.363	0.973	0.668
0.22	0.327	0.977	0.652
0.23	0.294	0.980	0.637
0.24	0.263	0.982	0.623
0.25	0.235	0.985	0.610
0.26	0.211	0.987	0.599
0.27	0.190	0.988	0.589
0.28	0.171	0.989	0.580
0.29	0.154	0.991	0.572
0.30	0.139	0.992	0.565

The balanced accuracy, which gives equal weight to positive and negative accuracy was used since the movie review test data was an imbalanced dataset with more positive than negative data (almost 5 to 1). The best sentiment classification performance in terms of balanced accuracy was achieved when the threshold was set to 0.1. We confirmed that the dictionary-based sentiment classification of Korean movie reviews performs similarly as that of the English customer product reviews.

3 Conclusion

We evaluated the sentiment classification performance of positive/negative movie reviews written in Korean using a movie domain Korean sentiment dictionary. The positive accuracy, negative accuracy, and the balanced accuracy of the positive/negative sentiment classification were 79.8%, 81.5%, and 80.7% respectively. We plan to perform a more sophisticated sentence analyses using our sentiment dictionary to improve the sentiment classification performance in the future.

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